

Hands-on Ultrasound Physics Workshop

April 24-25, 2010
Milwaukee, WI

MTMI

Medical Technology
Management Institute

- Hands-on LABs of QA testing procedures
- Scanning demonstrations on live models
- 15 MPCECs

Making Technology Work for You!

About the Workshop

The involvement of medical physicists in ultrasound imaging services is increasing at many facilities as they seek the accreditation to qualify for reimbursement by some insurance companies. The American College of Radiology (ACR) requires a medical physicist to oversee a quality assurance program in facilities seeking their accreditation. Medical physicists supporting these facilities need to update their skills as well as meet the continuing education requirements of various accrediting bodies. This workshop is designed to meet those needs and provide 15 hours of continuing education credits. An indepth review of ultrasound technology will be given along with an opportunity for hands-on application of quality assurance testing procedures. The workshop will be conducted by a well qualified faculty including two medical physicists in private practice. Wayne Hedrick is co-author of a book entitled "Ultrasound Physics and Instrumentation" and Terry Zipper is a physics member of the ACR Advisory Committee on Ultrasound Accreditation. The faculty also includes Mary Henne, a practicing sonographer and ultrasound physics instructor.

Who Should Attend

Medical physicists looking for an in-depth review of ultrasound physics including hands-on QA testing procedures while also acquiring the continuing education credits required by various accrediting bodies should attend. The workshop would be useful for medical physics students or residents learning ultrasound technology. Some sonographers looking for an indepth review of ultrasound physics and more understanding of ultrasound QA testing may find the workshop of value.

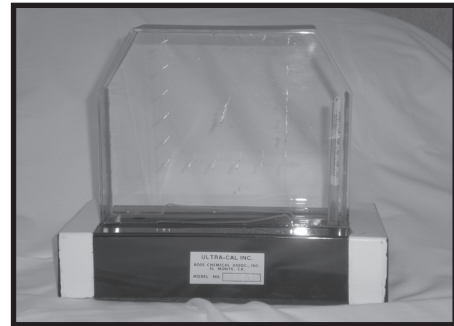
Workshop Format

The workshop will include material presented in lecture format with PowerPoint slides and video illustrations as well as a group demonstration of scanning a live model. Hands on laboratory sessions of QA testing procedures using various phantoms will provide opportunities to apply the testing procedures under the guidance of an knowledgeable and experienced faculty.

Educational Objectives

At the completion of this workshop, participants will:

- Have received the basic physical concepts of ultrasound.
- Have learned the properties and instrumentation of real time ultrasound transducers.
- Recognize artifacts in ultrasound images.
- Understand the principles and applications of Doppler ultrasound.
- Be able to design and implement an effective QA program for clinical ultrasound services.
- Have reviewed requirements for ultrasound facility accreditation.



Faculty

Wayne Hedrick, PhD
Medical Physicist
Aultman Hospital
Canton, OH

Terry Zipper, MS
President and Chief Physicist
Physics Consultants, Inc
Portland, ME

Mary Henne, MS, CNMT, RDMS, RVT
Education Programs Manager
MTMI
Milwaukee, WI

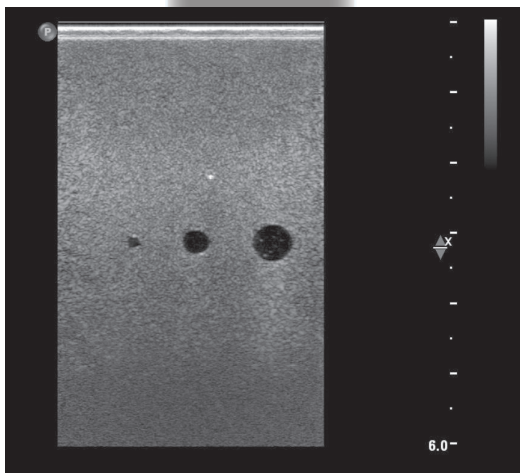
Program Directors

The Co-Program Directors for this workshop are

Wayne Hedrick, PhD from Aultman Hospital and **J. Ed Barnes, PhD** from MTMI.

Continuing Education Credit

Approval has been received from CAMPEP for up to 15 hours of Medical Physics Continuing Education Credit (MPCEC) for qualified medical physicists. A certificate documenting attendance will be provided to all participants.



Workshop Schedule

••••• <i>Day One</i> •••••	
7:15 am	Registration and Coffee
8:00 am	Basic Ultrasound Physics W. Hedrick <ul style="list-style-type: none"> • sound propagation • acoustic velocity • bulk modulus • reflection coefficient • interference • power • longitudinal waves • frequency • acoustic impedance • scattering • absorption • decibel • wavelength • reflection • refraction • attenuation • echo ranging
9:30 am	Transducer Properties T. Zipper <ul style="list-style-type: none"> • piezoelectric effect • pulsed wave • pulse repetition period • pulse duration • near field • mechanical focusing • time gain compensation • backing material • pulse repetition frequency • Q-value • far field • transmit power • A-mode with illustrative examples • matching layer • spatial pulse length • bandwidth • beam width
10:30 am	Informal Discussion and Break
10:45 am	Real-time Transducers W. Hedrick <ul style="list-style-type: none"> • image formation • frame rate • transmit focusing • curvilinear array • annular phase array • beam width • mechanical sector • dynamic receive focusing • linear phased array • 1.5D array • line density • linear array • vector array • 2D array
12:15 pm	Lunch (on your own)
1:15 pm	Real-time Instrumentation W. Hedrick <ul style="list-style-type: none"> • broadband techniques • spatial compounding • coded excitation • tissue harmonic imaging • frequency compounding • extended field of view • zone sonography • elastography • 3D & 4D
2:15 pm	B-mode Image Artifacts W. Hedrick <ul style="list-style-type: none"> • partial volume • comet tail • ghost image • velocity error • attenuation • mirror image • side lobe • reverberation • refraction • range ambiguity
3:15 pm	Informal Discussion and Break
3:30 pm	Clinical Safety T. Zipper <ul style="list-style-type: none"> • intensity descriptors • epidemiological studies • thermal index • heating • AIUM statements • mechanical index • cavitation
4:30 pm	B-mode Operator Controls M. Henne <ul style="list-style-type: none"> • depth • dynamic range • write zoom • reject control • display of thermal index • effect of controls on TI and MI • receiver gain • persistence • focal zone number and placement • gray-scale map • display of mechanical index • power • edge enhancement • presets • TGC
5:30 pm	Adjourn for the Day
••••• <i>Day Two</i> •••••	
7:00 am	Coffee
7:30 am	Doppler W. Hedrick <ul style="list-style-type: none"> • Doppler effect • PWspectral Doppler • maximum velocity waveform • autocorrelation • color flow imaging artifacts • velocity measurement • aliasing • color flow imaging • power Doppler • color controls • CW vs PW • duplex scanner • color controls
9:30 am	Informal Discussion and Break
9:45 am	Clinical Applications M. Henne
10:45 am	Quality Control W. Hedrick <ul style="list-style-type: none"> • tissue-mimicking phantoms • video test patterns • performance tests • hard copy recording
11:45 am	Lunch (on your own)
12:45 pm	ACR Accreditation T. Zipper
2:15 pm	Informal Discussion and Break
2:30 pm	Hands-on Workshops Faculty <ul style="list-style-type: none"> • Scanning tissue-mimicking phantoms • quality control tests • operator controls
4:00 pm	Questions, Answers and Wrap-up Faculty
4:15 pm	Adjourn Workshop

Registration

To register for this seminar:

- ☞ go to www.mtmi.net or
- ✍ complete the registration form below and
- ✉ mail it with your tuition to **MTMI**, or
- ☎ call **(800) 765-6864** using MasterCard or Visa, or
- ☎ fax the form to **(262) 717-9171** w/credit card info

Refunds, minus a \$50 administration fee, will be granted for cancellations received prior to 10 days before the course. Cancellations received within 10 days of the course will receive a credit toward a future **MTMI** program, minus the \$50 processing fee. No refunds will be made after the course.

MTMI reserves the right to cancel any scheduled program because of low advance registration or other reasons. **MTMI's** liability is limited to a refund of any program tuition paid.

Membership

Membership in the Medical Technology Management Institute includes:

- ◆ discounts on **MTMI** services
- ◆ member newsletter
- ◆ web access to replace certificates
- ◆ yearly transcripts
- ◆ special benefits throughout the year exclusive to members

Joining **MTMI** with this registration qualifies you for the member discount. Indicate your interest in membership on the registration form or call **MTMI**. Annual membership dues for physicians is \$59. Discount effective immediately. Also available, discounted **Group Membership**.

Registration Form

Hands-on Ultrasound Physics Workshop

Milwaukee, WI - April 24-25

Please Print Clearly - This is how your name will appear on your certificate.

Name: _____ degree/title: _____

Home Address: _____ City: _____

State: _____ Zip code: _____ e-mail: _____

registration confirmation will be sent to this e-mail address - **print clearly**

Day phone () _____ Eve. phone () _____ FAX () _____

I am a Medical Physicist; Sonographer; Biomedical Engineer; other; specify: _____

I work in the following: Mammography, CT, MRI, Ultrasound, Nuc Med, Rad Therapy, XR.



Please enclose payment to **MTMI**: \$650
MTMI member discount: \$620
Yes, I want to become an **MTMI** member! \$59
(discount effective immediately)

Total enclosed:
\$ _____

Credit Card Number: _____ Master Card Visa

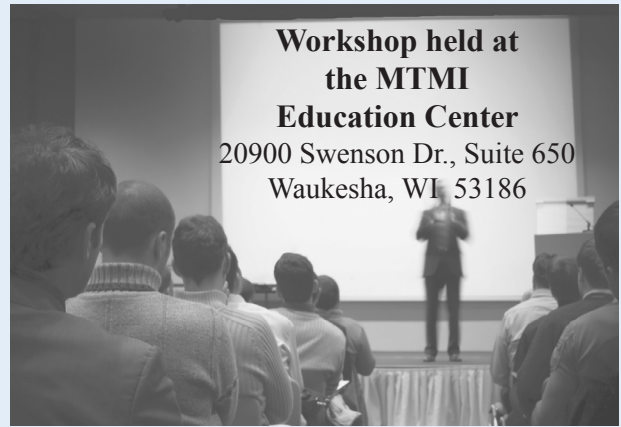
Expiration Date: _____ Signature _____

Return to: **MTMI** ♦ 20900 Swenson Dr., Suite 650 ♦ Waukesha, WI 53186

800-765-**MTMI**(6864) or 262-717-9797 or fax 262-717-9171 or e-mail custservice@mtmi.net

Your satisfaction with **MTMI** programs is guaranteed, a guarantee we are confident you won't need to use.

Location & Accommodations



Sleeping rooms at the Marriott West

W231 N1600 Corporate Court

Waukesha, WI 53186

262-574-0888 (front desk)

www.marriott.com/mkemw

Room Rate: single \$98, double \$121

Make reservations at least 2-weeks in advance of workshop, to assure availability.

Telephone reservations call **877-651-7666**
and mention you are a part of the **MTMI** group.

**Airport shuttle is free. Make reservations for
"Go Airport Connection" at 800-236-5450**

Marriott reservation includes:

- airport shuttle
- daily shuttle to/from **MTMI** Education Center
- breakfast buffet
- high speed internet access
- microwave & refrigerator (upon availability)